

REMARKS

Claims 37-38, 41, and 48 are currently amended. Claims 38, 41, and 48 were amended to conform them to currently amended claim 37. Applicant respectfully submits that the amendments contained herein are fully supported by the Specification as originally filed and therefore do not introduce new matter.

Examiner's Interview

Applicant's representative respectfully thanks Examiner William D. Coleman for the courtesy of discussing claim 37 with respect to its rejection under 35 U.S.C. § 102(e) and its rejection under 35 U.S.C. § 112, second paragraph, in a telephonic Examiner's interview on August 30, 2004, initiated by Applicant's representative. No agreement was reached with regard to the rejection under 35 U.S.C. § 102(e). Examiner Coleman indicated that changing "capable of" to "which can" in claim 37 will overcome the rejection under 35 U.S.C. § 112, second paragraph. Applicant contends that each phrase refers to the ability of the metal components to form a crystalline compound. Applicant thus contends that no change in scope would result from such an amendment.

Claim Rejections Under 35 U.S.C. § 102

Claims 37-40 and 44-50 were rejected under 35 U.S.C. § 102(e) as being anticipated by Rathore et al. (U. S. Patent 6,258,710 B1). Applicant respectfully traverses.

Claim 37, as currently amended, includes forming a layer of a metal alloy nitride on the diffusion barrier layer, wherein the metal alloy nitride comprises a first metal component, a second metal component which can form a crystalline compound with the first metal component, and nitrogen.

Applicant carefully reviewed Rathore et al. and found no indication of forming a layer of a metal alloy nitride on the diffusion barrier layer, where the metal alloy nitride comprises a first metal component, a second metal component which can form a crystalline compound with the first metal component, and nitrogen, as in claim 37.

Rathore et al. (column 8, lines 1-38) includes a layer 5 of an adhesive and contact metal, preferably titanium, tantalum, tantalum nitride, tantalum, chromium, tungsten, or any combination of these layers. An optional thermal diffusion barrier layer 6 of material such as

chromium--chromium oxide, tungsten-silicon, tungsten-nitride, tungsten-nitride-silicon, titanium-nitride, tantalum or tantalum-nitride is disposed on layer 5. Neither of layers 5 or 6 is a layer of a metal alloy nitride, where the metal alloy nitride comprises a first metal component, a second metal component which can form a crystalline compound with the first metal component, and nitrogen, as in claim 37. Rathore et al. further includes a layer 7 of an element that is capable of forming an intermetallic compound with copper that is disposed on layer 6, as shown in Figure 6. Such element may be selected from the group consisting of hafnium, lanthanum, zirconium, tin and titanium. Layer 7 is not a layer of a metal alloy nitride, where the metal alloy nitride comprises a first metal component, a second metal component which can form a crystalline compound with the first metal component, and nitrogen, as in claim 37. A thin copper seed layer 8 is formed on layer 7, as shown in Figure 7. Layer 8 is not a layer of a metal alloy nitride, as in claim 37. Therefore, Rathore et al. does not include each and every element of claim 37, and claim 37 should be allowed.

Claims 38-40 and 44-50 depend directly or indirectly from claim 37 and thus include patentable limitations of claim 37. Therefore claims 38-40 and 44-50 should be allowed.

Claim Rejections Under 35 U.S.C. § 103

Claims 41 and 43 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Rathore et al. Applicant respectfully traverses.

Claim 37 is patentably distinct from Rathore et al. and is nonobvious. Claims 41 and 43 depend directly from claim 37 and thus include patentable limitations of claim 37. Therefore claims 41 and 43 should be allowed.

Claim Rejections Under 35 U.S.C. § 112

Claim 37 was rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 37, as currently amended, overcomes this rejection, as per the Examiner's Interview summarized above.

Allowable Subject Matter

Applicant acknowledges that claim 42 was indicated as allowable.

CONCLUSION

In view of the above remarks, Applicant respectfully submits that claims 37-41 and 43-50 are in condition for allowance and requests reconsideration of the application and allowance of claims 37-41 and 43-50.

The Examiner is invited to contact the undersigned at direct dial (612) 312-2208 if there are any questions regarding this Response or if prosecution of the present application may be assisted thereby. No new matter has been added and no additional fee is required by this response.

Respectfully submitted,

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